

On some new and described species of arrhenophagine Encyrtidae (Hymenoptera)

by

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The species of *Arrhenophagus* Aurivillius are revised following examination of types. *Arrhenophagus intermedius* Blanchard and *A. parlatores* (Risbec) are synonymized with *A. chionaspidis* Aurivillius, and *A. albipes* Girault is placed as a synonym of *A. albitibiae* Girault. The type species of *Arrhenophagoidea*, *A. coloripes* Girault, is redescribed and three new South African species are described, namely *rolaspidis*, *chaetacmae* and *sierra*. A key is given to the females of the species of *Arrhenophagoidea*.

The need to determine an East African series of a species of *Arrhenophagus* Aurivillius, 1888 and several South African collections of species of *Arrhenophagoidea* Girault, 1915a—a genus hitherto known to us only from Australia—led to a reappraisal of the type species of both genera and of the type specimens of three other described species of *Arrhenophagus*. In one respect the results of the study have proved disappointing, for even now we are not entirely satisfied about the identity of the East African material which is of at least potential value in agriculture.

The subfamily Arrhenophaginae comprises three genera, namely, *Arrhenophagus*, *Arrhenophagoidea* and *Psyllechthrus* Ghesquière, 1958. Only species of the first two are dealt with in this paper: the monotypic African genus *Psyllechthrus* is well known from Ghesquière's (1968) studies on the type-species *P. oophagus* Ghesquière.

ARRHENOPHAGUS Aurivillius

Arrhenophagus Aurivillius, 1888: 144; Tachikawa, 1963: 240. Type species *Arrhenophagus chionaspidis* Aurivillius.

Mymariella Risbec, 1951: 402-3; Annecke & Insley, 1971: 6. Type species *Mymariella parlatores* Risbec

Six species of *Arrhenophagus* appear to be valid at present: *chionaspidis* (synonym: *Coccobius diaspidis* Ashmead, 1900); *albitibiae* Girault, 1915; *albipes* Girault, 1915; *intermedius* Blanchard, 1964; *parlatores* Risbec, 1951; and *diaspidiatus* Man Mohan, 1963. The authority for the published synonymy of *C. diaspidis* is Ghesquière (Krombein & Burks, 1967). De Santis (1964) queried the validity of *intermedius* and his suspicion is confirmed below. We have been unable to detect differences between the types of *albitibiae* and *albipes* and between *chionaspidis* and *parlatores* (synonymies introduced below), and we are uncertain about the status of *diaspidiatus* the type of which we have not seen.

The species of *Arrhenophagus* resemble those of *Arrhenophagoidea* closely. The genera are distinguished by the tarsi: four-segmented in *Arrhenophagus* and five-segmented

in *Arrhenophagoidea*. The species of both genera are of minute size, ranging in length around 0.5 mm, and the specimens tend to shrivel badly when dried.

Arrhenophagus chionaspidis Aurivillius, figs 1–9

Arrhenophagus chionaspidis Aurivillius, 1888: 142; Howard, 1895: 239–40; 1898: 135–6; Howard & Ashmead, 1896: 641; Mercet, 1921: 53–4; Ferrière, 1949: 370; Tachikawa, 1957: 174–5 (in part); 1963: 240–1 (in part); De Santis, 1964: 38–40; Hoffer, 1964: 119–21.

Coccobius diaspidis Ashmead, 1900: 408; Ghesquière in Krombein & Burks, 1967: 245.

Arrhenophagus intermedius Blanchard in De Santis, 1964: 40–1, **syn. nov.**

Mymariella parlatoresae Risbec, 1951: 402–3, **syn. nov.**

Arrhenophagus parlatoresae (Risbec), Annecke & Insley, 1971: 6, 37.

Material at hand (detailed below) includes females from the type series that was stated (Aurivillius, 1888) to have been reared from *Chionaspis salicis* (Linnaeus) in Sweden. Also at hand are two slides determined by Aurivillius (handwriting kindly identified by B. D. Burks, United States National Museum, Washington) which probably formed the basis of Howard's (1895) determination of *A. chionaspidis* from the United States.

Using this material as a reference we have been able to confirm the determinations of the species made by Ferrière (1949) and De Santis (1964). We have examined types of *A. intermedius* Blanchard and do not hesitate to confirm the suggestion made by De Santis (1964) that *intermedius* is a synonym of *chionaspidis*.

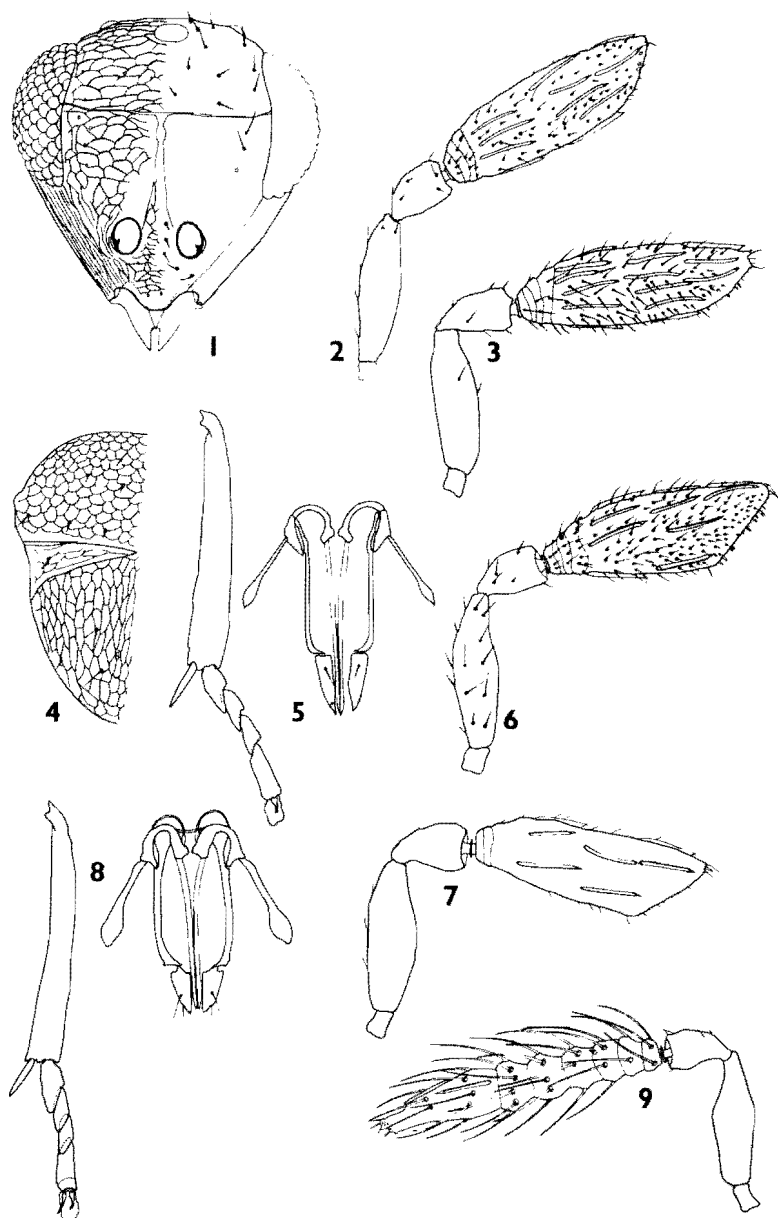
The four female syntypes of *Mymariella parlatoresae* Risbec have been re-examined after they were remounted on separate slides. A lectotype was selected and designated. We were unable to distinguish between this material, which now satisfactorily displays the characters, and *chionaspidis*: the synonymy is therefore introduced above.

A. chionaspidis was recorded from several diaspidid hosts in Japan by Tachikawa (1957, 1958, 1963). Of the Japanese material we have examined a series reared from *Fiorinia vaccinia* Kuwana, and we cannot concur in the determination. There are differences between this series and what we believe to be true *chionaspidis* that are taken to be of specific value. The Japanese material is here determined as *A. albitibiae* Girault.

It has become necessary to supplement De Santis' (1964) detailed redescription of *A. chionaspidis* in certain respects so that the species may be distinguished from *A. albitibiae*.

FEMALE. Head viewed anteriorly (fig. 1) with clypeal margin of mouth strongly emarginate at base of each mandible, leaving a rather narrow ventral projection of the clypeal margin medially; mandible (fig. 1) rather long and narrow; sculpture of head cellulate-reticulate, the sculptural ridges on face extremely fine (almost invisible in some faded, slide-mounted types), those on fronto-vertex plainly more raised, enclosing rather small cells; antenna (figs 2–3) with segmentation of funicle indistinct variable: two- to four-segmented (not including ring segment), sometimes with incomplete intersegmental septa; mesothoracic sculpture as in fig. 4, the cells of the scutellum lacking aciculations; middle leg with tibial spur and adjoining tarsal segment as in fig. 5; gaster with ovipositor (fig. 5) about 3.5–5.0 times as long as gonostyli, approximately two-thirds length of middle tibia; gonostyli a trifle longer than middle tibial spur.

We have not seen the rare male of *A. chionaspidis*. Two single male specimens have been recorded, one by Howard (1898) from Macao, and the other by Hoffer (1964) from Czechoslovakia. Both these specimens were said to have the antenna funicle



Figs 1–9. *Arrhenophagus chionaspidis* Aurivillius. 1. Head, anterior (♀T 4376–1). 2. Antenna (T4234–2, ♀-syntype). 3. Antenna (*A. intermedius* Blanchard ♀-syntype). 4. Mesonotum, left side (♀T 4376–2). 5. Ovipositor and middle tibia, drawn to the same scale (♀T 4234–3, syntype). 6–7. Right antenna, inner aspect showing variable segmentation of funicle (Uganda material, ♀T 4246–8 and ♀T 4246–5). 8. Ovipositor and middle tibia, drawn to the same scale (Uganda material, ♀T 4246–8). 9. Male antenna (Uganda material, ♂T 4246–3).

four-segmented whereas that of the males described by Tachikawa (1957) from Japan is six-segmented, providing a further clue to the specific distinctness of the Japanese material.

Finally, two series, one from *Aulacaspis tegalensis* (Zehntner) on sugar cane and the other from *Pinnaspis strachani* (Cooley) on *Pelargonium* sp. in Uganda are here determined with considerable hesitation as *A. chionaspidis*. In the former series there would appear to be a biological difference in that males are apparently abundant or at least common. In the series of 353 females from *Pinnaspis strachani*, not a single male is present and apart from the slight differences listed below, no distinguishing characters could be found to separate this series from *A. chionaspidis*. Morphologically the specimens resemble *chionaspidis* to a degree: in the female only the ovipositor and associated structures (fig. 8) appear to differ slightly, the gonostyli being relatively shorter and somewhat broader at base; the female antenna is very like that of *chionaspidis*, with similar variation in segmentation of the funicle (figs 6, 7); in the male, the antennal funicle (fig. 9) is six-segmented though quite different from that of the male described by Tachikawa (1957, 1958). It is possible that the Uganda form from *Aulacaspis tegalensis* will prove to be specifically distinct from *chionaspidis* but we are not satisfied at this stage that the characters mentioned are of specific value.

MATERIAL EXAMINED. SWEDEN: Type series ex *Chionaspis salicis*, 23 ♀ (T 4234); SWITZERLAND: "Genève éclos Mai-Juin 1946 ex *Aulacaspis rosae* s. rosiers," 47 ♀ det Ch Ferrière; HUNGARY: "Budapest, 18.ix.1887, de *Diaspis rosae* L". 3 ♀ (U.S. National museum material, det. Aurivillius); "Hungria s/ *Aulacaspis rosae* Beche, col. Erdős-7/ix/1956"; 1 ♀ (Museo de la Plata material, det. Erdős); BRAZIL: "G.Daz(Corrientes) s. *Unaspis citri* leg. Esquirel xii. 1946" 4 ♀ (Museo de la Plata material, det. De Santis); Olinda and Pernambuco, iii. 1972, Pereira, "ex *Coccoidea* sp." 15 ♀ det. De Santis (T 4376); ARGENTINA: 17 ♀-syntypes of *A. intermedius* Blanchard, data as detailed by De Santis (1964: 41); UGANDA: Kampala, 6.iv.1972, D.J. Greathead, ex ♂ *Aulacaspis tegalensis*, C.I.B.C. lab. culture from stock ex Tanzania, 68 ♀ 41 ♂ (T 4246); Kampala, i.1973, ex *Pinnaspis strachani* (Cooley) on *Pelargonium* sp., 353 ♀ (T 4647); SENEGAL: Bambey, J. Risbec, "ex *Parlatorea ziziphi*", ♀-lectotype, 3 ♀ (T 4745, type series of *Mymariella parlatoreae* Risbec, in Muséum National d' Histoire naturelle, Paris).

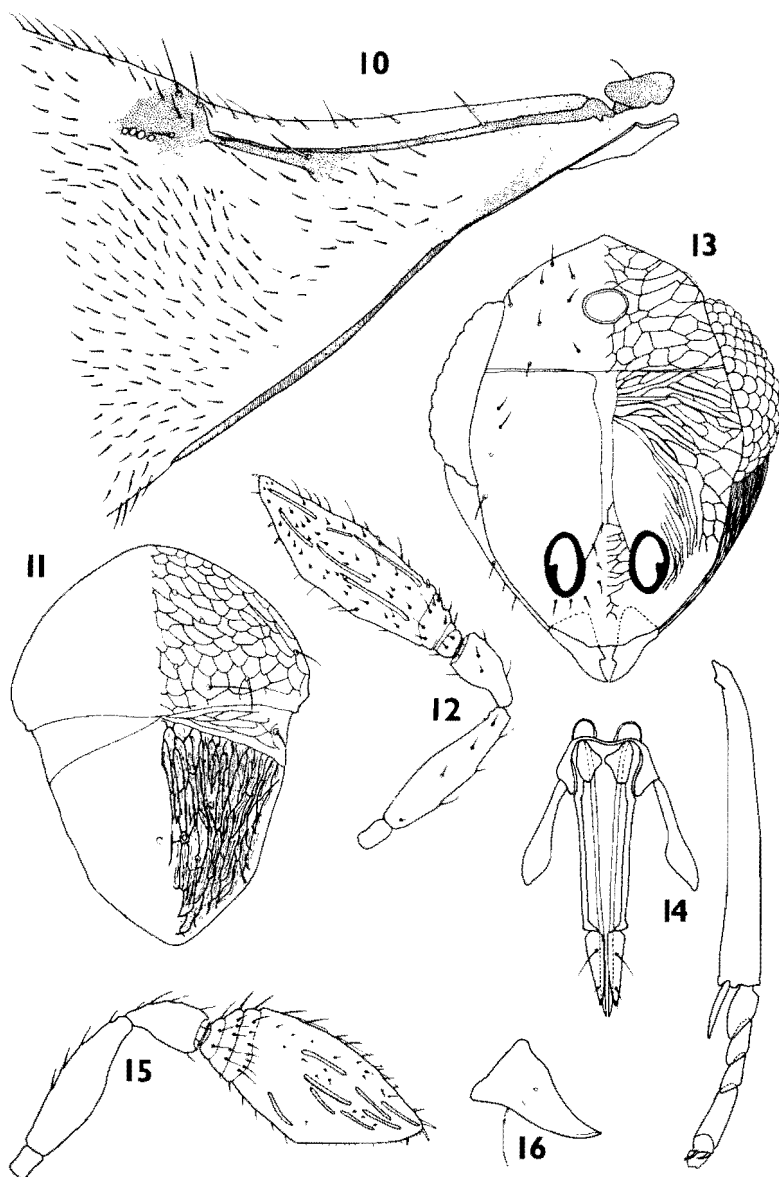
Arrhenophagus albitibiae Girault, figs 10-14

Arrhenophagus albitibiae Girault, 1915: 241-2.

Arrhenophagus albipes Girault, 1915: 242, **syn. nov.**

Arrhenophagus chionaspidis: Tachikawa, 1957: 174-6 (i n part); 1958: 118-9; 1963 240-3 (in part); 1970: 104-6.

The types of *A. albitibiae* and *A. albipes* have been studied. The former species was described from material reared from the males of "*Fiorinia saprosema* Green" (properly *Fiorinia saprosmae* Green) in Ceylon; it was determined as *A. chionaspidis* by Howard (1896). *A. albipes* was based on specimens reared from females of *Chionaspis* (now *Phenacaspis*) *eugeniae* Maskell in Hong Kong; Girault (1915b) also records specimens, which we have not seen, from Japan. Girault's original descriptions of these species are extremely brief and the distinguishing characters used by him, namely, wing and leg colour, so slight that we regard them to be intraspecific variations. In other characters, listed below, that we believe to be more reliable, the specimens are alike, and not different from Japanese material at hand determined by Tachikawa (1963) as *chionas-*



Figs 10–14. *Arrhenophagus albitibiae* Girault, female. 10. Base of left fore wing (T 4264–1). 11. Mesonotum (T 4263–1). 12. Right antenna, inner aspect (T 4263–2). 13. Head, anterior (T 4263–1). 14. Ovipositor and middle tibia, drawn to the same scale (T 4263–1). Figs 15–16. *Arrhenophagoidea coloripes* Girault, female. 15. Antenna (Indooroopilly material, det. Girault). 16. Mandible (holotype).

pidis. Unfortunately the single *albipes* male specimen lacks head and antennae but nevertheless the synonymy proposed above appears to be justified.

FEMALE. Clypeal margin of mouth (fig. 13) not or only slightly emarginate at base of each mandible; antenna as in fig. 12; sculpture of head cellulate-reticulate, the cells rather large and the sculptural ridges on fronto-vertex extremely fine (fig. 13); mesothoracic sculpture as in fig. 11, the cells of the scutellum with fine but clearly visible aciculations; basal part of fore wing as in fig. 10; gaster with ovipositor about as long as middle tibia (fig. 14); gonostyli tending to be longer and more slender (fig. 14) than in *chionaspidis* but as there is some variation in the latter species in this character, this may not be an altogether reliable character.

MALE. Differs from the female only in sex characters and in the antenna (figured by Tachikawa, 1957: 175, fig. B; 1958: 118, fig. 1).

MATERIAL EXAMINED. *A. albitibiae*: 4 ♀-syntypes "*Fiorina saprosema* Green, on male scales, Handy, Ceylon, Koebele" (USNM Type No. 19882); *A. albipes*: 3 ♀ 1 ♂ (headless) syntypes "*Chionaspis eugeniae* Mask., on ♀ scales, Hong Kong, Koebele" (USNM Type No. 19883); JAPAN: Matsuyama, 10.v.1957, T. Tachikawa, ex *Fiorinia vaccinia* Kuwana, 5 ♀ 7 ♂ (T 4263).

ARRHENOPHAGOIDEA Girault

Arrhenophagoidea Girault, 1915a: 73. Type species *Arrhenophagoidea coloripes* Girault.

This genus was erected for the type species, *A. coloripes* Girault, which was described from a single female collected at Ingham, Queensland in 1913. The genus was revised by the same author (1932) in a unpublished manuscript which also includes a description of the male of the type species.

The type material, in very poor condition on a slide, as well as two other broken, uncleaned, slide-mounted females, collected on a window at Indooroopilly on March 30, 1930, have been examined. This material is in the Queensland Museum, Brisbane, Australia.

The generic characters which in combination are diagnostic of *Arrhenophagoidea*, are given below.

COLOUR (♂ ♀): Head and body blackish-brown, shiny; eyes red; legs pallid, or more frequently with parts brownish, varying intraspecifically; fore wing hyaline except immediate base which is slightly infuscated; hind wing entirely hyaline.

FEMALE: Head with fronto-vertex a little more than one-half head width; ocelli large, in a obtuse-angled triangle; antennal insertions about their own length from the mouth, more or less than their own length apart; scrobes moderately deep, inverted V-shaped, their confluence separated medially by a longitudinal membranous interruption in the sculpture of the face; junction of fronto-vertex and face with a similar interruption running transversely between the eyes (the fore-going characters could not be established for the type species because of the poor condition of the material); mandible unidentate, the inner surface near apex concave, the tip acute, giving the effect of a pointed scoop; maxillary palpi with two or three segments, labial palpi with one segment; mouth margin emarginate at base of each mandible, leaving a ventral projection of the clypeal margin medially; antenna with scape slightly expanded

ventrally, not more than four times as long as its greatest width; all funicle segments wider than long; club with one complete septum, with one complete and one partial septum, or undivided; obliquely truncate from near apex, much longer than funicle; fronto-vertex and face cellulate-reticulate, the sculptural ridges on the former somewhat raised. Thorax with mesoscutum more than twice as wide as long in cleared slide-mounted specimens, rather sparsely setose, cellulate-reticulate; scutellum slightly wider than long, with six or eight long slender setae, the sculptural cells long and narrow, becoming broader near apex, with fine aciculations. Legs not especially modified, tarsi five-segmented, the fourth and fifth segments broadly connected. Fore wing broad, almost one-half as wide as long; immediate base of wing devoid of setae, otherwise the wing save speculum evenly and densely setose; submarginal vein with one or two long setae near base and one, two or three towards apex, their number and position being species-specific; apex of venation not clearly defined, infuscated: marginal vein and apex of submarginal marked by a stout seta, the stigmal vein marked only by the four sensillum-like rings; speculum broad, closed caudally by a row of setae; marginal cilia long; hind wing evenly setose from near base to apex. Abdomen longer than thorax in clear slide-mounted specimens; gaster with ovipositor and gonostyli slender, acute at apex, longer than middle tibial spur.

MALE: Differing principally from the female in the following characters; antennal insertions higher on face; antenna with funicle six-segmented, the club not divided (except in *sierra* spec. nov.), narrowing distad, the apex bluntly pointed; funicle and club with long setae.

Arrhenophagoidea coloripes Girault, figs 15–16

Arrhenophagoidea coloripes Girault, 1915a: 73

It is necessary here to mention some additional characters that distinguish this species from the three new species of the genus.

FEMALE: Antenna (fig. 15) six-segmented; scape about 3.5 times as long as its greatest width; pedicel large, almost half as long as scape; funicle with three segments (not including ring segment), sub-equal in length, increasing progressively in width, III more than 1.5 times as wide as I; club widening slightly towards middle, about four times as long as funicle; mandible as in fig. 16; maxillary palpi with three segments; scutellum with eight setae; middle tibial spur a trifle longer than basal segment of middle leg; submarginal vein with two long setae near base and one towards apex; fringe cilia of fore wing shorter than setae on submarginal vein; gonostyli longer than middle tibial spur (about 3:2).

MALE: The male of this species has not been seen. According to Girault's unpublished manuscript, the characters are as follows: fore and middle legs, except the coxae, pale; antenna pale, otherwise like the female; antenna nine-segmented, the segments of the funicle quadrate, shorter than the pedicel, clothed with long setae; club not segmented, slightly exceeding the body of the scape which is somewhat dilated beneath except at apex.

***Arrhenophagoidea rolaspidis* spec. nov., figs 17-21**

FEMALE: Antenna with scape yellowish-white, the flagellum dusky to brown; all coxae dusky or dark brown, the trochanters much paler; fore leg yellowish-white or with femur and tibia or femur only predominantly dusky to pale blackish-brown, the base and apex of each segment yellowish-white; middle and hind legs with femora dusky to pale blackish-brown, fading to yellowish-white at the base and apex, the middle femur in some specimens uniformly yellowish-white; remainder of middle and hind legs yellowish-white.

Head (fig. 20) with membranous interruptions in sculpture rather narrow; maxillary palpi with three segments; mandible as in fig. 21; antenna (fig. 18) with scape about four times as long as its greatest width; pedicel large, not quite twice as long as wide, longer than all the funicle segments together; funicle six-segmented, the segments subequal in length, strongly transverse, increasing in width towards the club, VI about twice as wide as I; club two-segmented or with a second septum which is incomplete or entire but indistinct, making the club almost or fully three-segmented; club evenly setose with three rows of long slender rhinaria.

Thorax (fig. 17) with mesoscutum flat or very gently convexed in dried specimens; scutellum with eight setae; mesothoracic sculpture as in fig. 17. Middle tibial spur about as long as basal tarsal segment of middle leg. Fore wing with submarginal vein with one long seta near base and three or four towards apex.

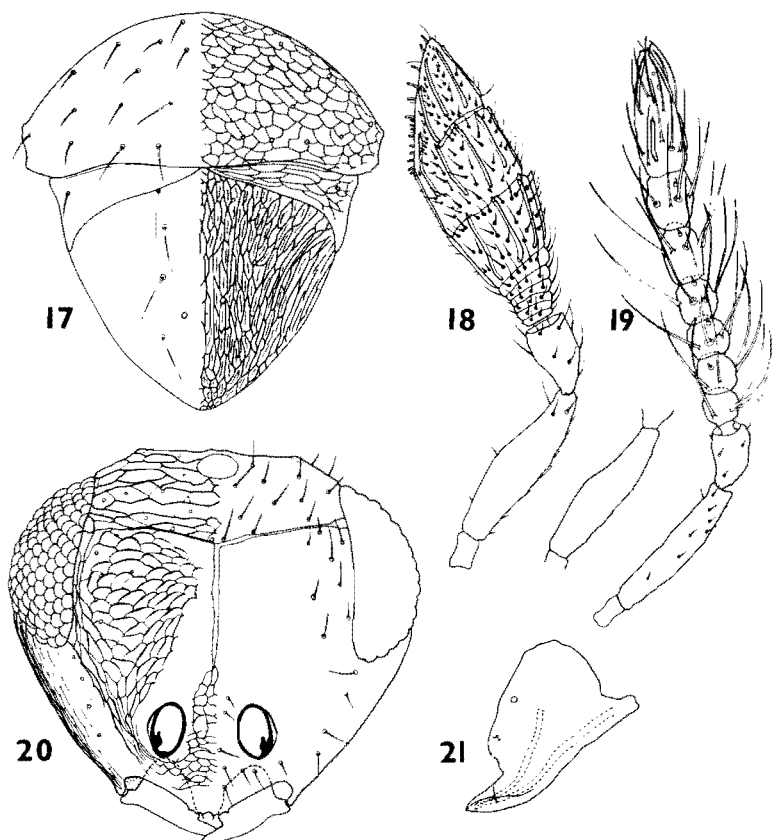
Gaster with ovipositor 2.5 to three times as long as gonostyli, the latter long and slender, more or less three times as long as middle tibial spur.

MALE: Scape and pedicel yellowish-white, remainder of antenna dusky; fore and hind tibiae with broad dusky suffusions, otherwise as in female. Antenna (fig. 19) with scape slightly more than four times as long as its greatest width, about 2.5 times as long as pedicel; funicle segments I to IV sub-quadrate or slightly transverse, V and VI longer than wide; club longer than the preceding two funicle segments together; funicle segments V and VI and club with long slender rhinaria, visible in some specimens only on the outer aspect; in some specimens funicle VI may be interpreted as the basal club segment because of its broad, hardly constricted union with the club.

MATERIAL EXAMINED. ♀-Holotype, 154 ♀- and 101 ♂-paratypes with the following collection data: SOUTH AFRICA: Tradouw Pass, C.P., i.1968, J. Munting, ex *Rolaspis* sp. on *Colpoen compressum* (T 3018, 126 ♀, 74 ♂); Jeffreys Bay, C.P., iii.1970, H. P. Insley, ex *Rolaspis lounsburyi* (Cooley) on *Sideroxylon inerme* (T 3392, 16 ♀, 12 ♂); Mkuzi Reserve, Ntl., viii. 1969, H. P. Insley, ex *Rolaspis* sp. on *Dovyalis longispina* (T 3161, ♀-holotype, 6 ♀, 8 ♂); Knysna, C.P., iii.1970, H. P. Insley, ex *Rolaspis lounsburyi* on *Sideroxylon inerme* (T 3515, 4 ♀); Port Elizabeth, C.P., xii.1963, J. F. de Villiers, ex *Rolaspis spiculata* on *Colpoen compressum* (T 1592, 2 ♀, 3 ♂). Holotype and paratypes in Plant Protection Research Institute, Pretoria; paratypes in British Museum (Natural History), London, and in United States National Museum, Washington.

***Arrhenophagoidea chaetacmae* spec. nov., figs 22-25**

FEMALE: Colour as in the female of *A. rolaspidis* except for the pedicel which is yellowish-white and the absence of specimens with entirely yellowish-white middle femora.



Figs 17–21. *Arrhenophagoidea rolaspidis* spec. nov. 17. Mesonotum (♀-holotype). 18. Left antenna, outer aspect (♀-paratype T 3515–2). 19. Left antenna, outer aspect (♂-paratype T 3161–3). 20. Head, anterior (♀-paratype T 3018–2). 21. Left mandible (♀-paratype T 3018–5).

Head (fig. 24) with membranous interruptions in sculpture broader and more conspicuous than in *A. rolaspidis*, the cells of the fronto-vertex smaller; maxillary palpi with two segments; mandible as in fig. 25; antenna (fig. 23) with scape about four times as long as its greatest width; pedicel large, a little less than one-half as long as scape; funicle with three segments, the segments very indistinct in most cleared specimens; funicle I small, about one-half as wide as III; funicle II and III slightly variable in size, III wider than II; club two-segmented with a second incomplete septum, more than 5,5 times as long as funicle; club with three rows of long slender rhinaria.

Thorax with mesoscutum gently convex in dried specimens; scutellum with six long setae, the sculptural cells towards apex slightly longer than in *A. rolaspidis*. Middle tibial spur as long as or slightly longer than basal tarsal segment of middle leg.

Fore wing (fig. 22) with submarginal vein with one long seta near base and one towards apex.

Gaster with ovipositor a little less than four times as long as gonostyli; gonostyli broader than in *A. rolaspidis*, only slightly longer than middle tibial spur.

MALE: Flagellum dusky, colour otherwise as in female; antenna very similar to that of the male of the previous species with scape a little more dilated ventrally, less than four times as long as its greatest width.

MATERIAL EXAMINED. 73 ♀ and 7 ♂ (T 1017, ♀-holotype and 79 paratypes) with the following collection data: SOUTH AFRICA: Durban, Ntl., ii.1962, J. Munting, with *Rolaspis chaetacmae* on *Chaetacme aristata*. Holotype and paratypes in Plant Protection Research Institute, Pretoria; paratypes in British Museum (Natural History), London, and in United States National Museum, Washington.

***Arrhenophagoidea sierra* spec. nov., figs 26–29**

This species is set apart from the other known species of *Arrhenophagoidea* by the bidentate mandible and the two-segmented club in the male antenna.

COLOUR (♂ ♀). Antenna dusky to brown, the scape slightly paler; legs with coxae brown to blackish-brown, trochanters pale, femora and tibia predominately blackish-brown, the base and apex of each segment much paler; tarsi sordid white; dark pigmentation of fore and middle legs paler than that of hind leg.

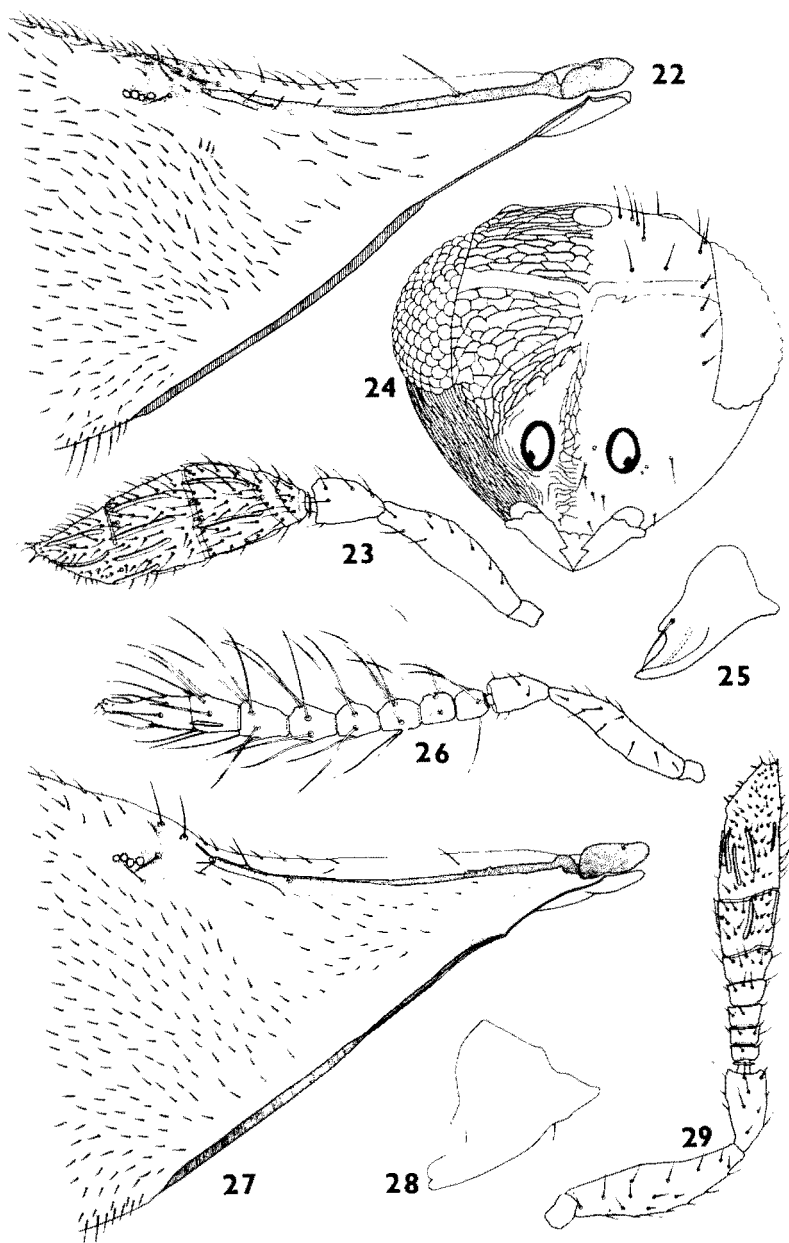
FEMALE: Head very similar to that of the previous two species, the sculptural cells of the fronto-vertex somewhat smaller than in *A. rolaspidis*; maxillary palpi two segmented; mandible as in fig. 28, with two small blunt teeth, the apex not acute as in the other known species of the genus; antenna (fig. 29) with scape almost five times as long as its greatest width; funicle five segmented; all funicle segments transverse, increasing gradually in length and width towards the club, V almost twice as wide as I; club two-segmented or with a second incomplete septum visible only on the outer aspect of distal club segment; club plainly longer than all the funicle segments together; only club segments with rhinaria.

Thorax with aciculations in scutellar sculpture less conspicuous than in the other three species, hardly visible; scutellum with six long setae. Middle tibial spur shorter than basal tarsal segment of middle leg. Fore wing (fig. 27) with submarginal vein with one long seta near base and two towards apex.

Gaster with ovipositor about 2,5 times as long as gonostyli, the latter about 2,5 times as long as middle tibial spur.

MALE: Antenna (fig. 26) with scape about 4,5 times as long as its greatest width; pedicel a little less than one-half as long as scape; funicle segment I quadrate, II–VI longer than wide, each segment slightly longer than the preceding one, VI almost twice as long as I; club two-segmented, as long as the preceding three funicle segments together; funicle V or VI and club with rhinaria, usually only visible on the outer aspect of the segments.

MATERIAL EXAMINED. 3♀ and 4♂ (T 3653, ♀-holotype and 6 paratypes) with the following collection data: SOUTH AFRICA: Cedarberg, C.P., x.1970, H. P. Insley, ex *Versiculaspis* sp. on *Agathosma virgata*. Holotypes and paratypes in Plant Protection Research Institute, Pretoria.



Figs 22–29. *Arrhenophagoidea* species. 22–25. *A. chaetacmae* spec. nov., female. 22. Base of left fore wing (♀-holotype). 23. Left antenna (♀-holotype). 24. Head, anterior (♀-paratype T 1017–7). 25. Left mandible (♀-paratype T 1017–9). 26–29. *A. sierra* spec. nov. 26. Male antenna (T 3653–2). 27. Base of left fore wing (♀-holotype). 28. Left mandible (♀-holotype). 29. Right antenna, inner aspect (♀-holotype).

KEY TO THE SPECIES OF *ARRHENOPHAGOIDEA* GIRAULT

FEMALES

- 1 Maxillary palpi with three segments; scutellum with eight setae 2
 — Maxillary palpi with two segments; scutellum with six setae 3
 2 Antenna with funicle three-segmented, club undivided **coloripes**
 — Antenna with funicle six-segmented, club two-segmented with a second septum which is incomplete or entire but indistinct **rolaspidis**
 3 Antenna with funicle three-segmented, club two-segmented with a second incomplete septum; mandible with one tooth, acute at apex **chaetacmae**
 — Antenna with funicle five segmented, club two-segmented or with a second incomplete septum; mandible with two small blunt teeth **sierra**

ACKNOWLEDGEMENTS

We are greatly indebted to the following persons for the loan and/or gift of material used in this study: Dr C. Besuchet, Muséum d' Histoire Naturelle, Geneva, Switzerland; Dr B. D. Burks, U.S. National Museum, Washington, U.S.A.; Mr E. Dahms, Queensland Museum, Brisbane, Australia; Dr L. De Santis, Universidad Nacional De La Plata, Buenos Aires, Argentina; Dr K. Hedqvist, Swedish Natural History Museum, Stockholm, Sweden; Dr J. R. Steffan, Muséum National d' Histoire naturelle, Paris, France; Professor T. Tachikawa, Ehime University, Matsuyama, Japan.

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Manuscript received 28 September 1973.